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GeGI overview for IAEA

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Disclaimer

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Annex 2: Preliminary information for proposed technology for the 2015 IAEA Technology Evaluation Workshop (TEW) on gamma imaging

1. Contact information

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2. Product identification

Germanium Gamma-Ray Imager (GeGI) is a germanium based imaging system commercially available from PHDs Co.

3. Mobility

3.1. Size

30×15×23cm

3.2. Weight (With and without battery)

Instrument - 15 kg
Battery – 1 kg

3.3. Battery operation

Internal lead battery allows for ~45 minutes operation. Hot-swappable external LiPo batteries allow for 2-3 hours each.

3.4. Ruggedness, environment

Describe how the technology has been ruggedized for harsh environment(s).

4. Technology

4.1. Detector material

Germanium

4.2. Detection volume

1 cm thick x 8 cm diameter ~ 50cm^3

4.3. Number of pixels
Single segmented germanium crystal, readout using 32 channels.

4.4. Compton/Pinhole/Coded mask?
All three are supported. Removable tungsten pinhole and coded aperture.

5. Resolution

5.1. Angular resolution

Describe the spatial resolution or separation of sources in degrees.

5.2. Field of view:

Pinhole	60° Forward
Coded Aperture	~60° Forward
Compton	4π

5.3. Energy range

Pinhole	40 - 500 keV
Coded Aperture	40 - 500 keV
Compton	150 - <3000 keV

5.4. Sensitivity 137Cs
1 mCi source at 25 m (measured results)

Alarm: 3 minutes (3 sigma detection)
Identify: 8 minutes (8 sigma detection)
Localize: 14 minutes (3 sigma localization)

5.5. Sensitivity 57Co
Not measured

5.6. Sensitivity RGPu / WGPu
GeGI has been used to image WGPu in many forms (shielded, unshielded, various shapes etc.) but specific sensitivity numbers are not available at this time.

5.7. Sensitivity NU / LEU / HEU
100 grams HEU, 98% enriched, at 28 m (measured results)

Identify: 15 minutes (8 sigma detection)
Localize: 39 minutes (3 sigma localization)

6. Graphical user interface (GUI)

6.1. Interface
The software offers an integrated environment for instrument control, data acquisition, and analysis. The spectrum window allows the user to interact with the spectrum similar to other commercial analysis software; the imaging panel provides an overlay of the optical camera and radiation measurement to assist in localizing the sources present.

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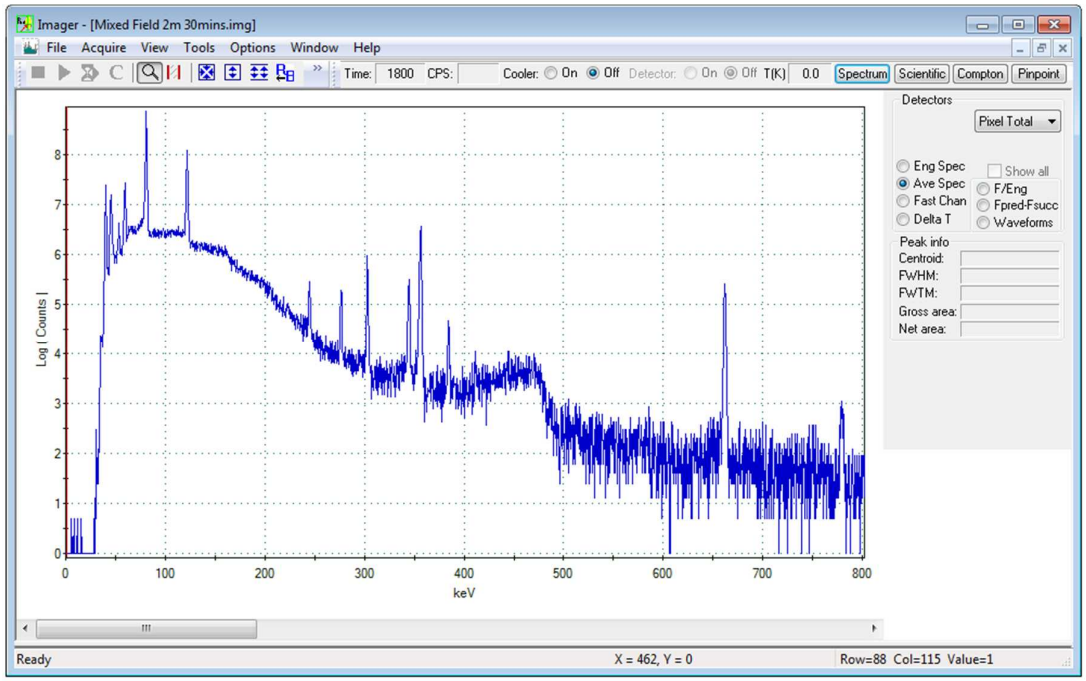

6.2. Processing software

Software has the following features for processing and analysing data

- Basic isotope identification
- Identification of “hot spots” in the image, identified by source ID
- Overlay of gamma-ray image with optical image
- Automated alarming